NASA Administrator

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Remarks as Prepared for Delivery

Opening Ceremony

Rhode Island Manufacturing Week

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Thank you, Senator Reed for the kind words of introduction.

Governor Almond, Representative Weygand, ladies and gentleman.

It is a real pleasure to be here at Slater Mill -- the home of the American Industrial Revolution -- to help kick off Manufacturing Week.

I think it's only fitting:

We meet at a place that symbolizes Rhode Island's proud past to talk about Rhode Island's promising future.

I must admit, I have a warm spot in my heart for this part of the country.

New England happens to be the home of one of my favorite moments since becoming NASA Administrator.

I was in Maine sitting through a fascinating lecture -- a presentation, really -- on remote sensing.

The researchers delivering the presentation were using the Internet to pull down the latest images from a NASA Landsat satellite.

Then, the lead researcher analyzed the images and told me, in no uncertain terms, exactly what the images and data told us about his town's ecosystem and land use.

He was by all counts an expert in the field of remote sensing.

He had tremendous poise and confidence.

Here's the catch: He was in the third grade -- a skinny little fellow with horn-rimmed glasses.

And his colleagues -- the other distinguished researchers? Also only about nine years old.

It was mind-boggling. I mean, think about it . . . a classroom full of nine year-old experts on satellite imagery and remote sensing.

I was reminded of that trip after I seeing a recent copy of Newsweek.

There was a survey which measured the technological expertise of sixth graders and Fortune 1000 senior executives.

Only 23 percent of the execs could explain what a modem was . . . compared to 93 percent of the sixth graders.

98 percent of the sixth grader knew the Internet is not owned by anyone. 68 percent of the "suits" thought it was (1/3 of them thought it was Microsoft).

The fine print of that survey and what happened to me in Maine is that children speak a different language.

But the big story is that we live in a different time.

Science and technology dominates our lives like never before.

And perhaps the last time we witnessed such a transformation in how we manufacture goods and how we do business was when Samuel Slater opened this mill over 200 years ago.

We meet today because the company and manufacturer that understands this transformation . . . the company that is really comfortable with science and technology . . . will be miles ahead of those that aren't.

And the country that understands this will also have an enormous edge.

Because the fact is, science and technology make possible every single day what we could not even imagine years ago.

In many ways, that is the NASA story -- opening the air and space frontiers. . . pioneering the future . . . and making things possible.

And because that's what we are about . . . we have not only explored new worlds, we have enriched life here on Earth.

We have been able to do that, I believe, because our missions are the kind of noble and bold tasks that a country needs to sustain itself.

They are missions of the past that shake people's souls . . . like Apollo.

They are missions of the present that inspire our children to work hard, to learn and to discover . . . like the Hubble telescope . . . the Mars Pathfinder . . . and the International Space Station.

And they are missions of the near-future and future . . . the missions that give us and our children hope . . . because there is more to life than just survival:

Detecting Earth-sized planets around stars within 100 light years and doing that with a telescope so powerful, that we might be able to pick up signs of life if they exist . . . .

Launching self-thinking, self-tasking, and self-repairing probes into interstellar space . . . .

Developing the spacecraft and satellite capability to improve our current five day forecasts to

seasonal and inter-annual forecasts, and then hopefully, multi-decade predictions of weather and climate . . . .

Cutting travel time across the Pacific in half and then, ultimately, by a factor of 10. . . .

Improving safety and lowering costs to a level where space travel is not limited to NASA astronauts . . . .

Having a research station on a near-Earth asteroid . . . .

And my dream . . . gaining enough knowledge on the International Space Station to leave Earth orbit so hopefully one day, an astronaut wearing a white suit with an American flag on her shoulder, can climb down the steps of a spacecraft . . . and crunch her boot on the dusty red surface of Mars.

All of these missions -- past, present and future -- have something in common.

They reveal new worlds. And the technology that enables them, when applied back here on Earth, creates new futures . . . especially for our children.

The Apollo program helped create the semi-conductor industry and helped revolutionize the electronics, materials, satellite and emerging software industries.

The Hubble Space Telescope led to a technology that helps us detect breast cancer earlier.

Protein crystals grown on the Shuttle and Mir complimented ground-based research at biomed companies in drug design that help us treat diseases.

These examples highlight a wonderful relationship for our country.

NASA has bold and difficult missions that require revolutionary leaps in technology.

If the technologies we need to accomplish our goals are not yet available, we create them.

And then, because our customer is the American people, we help manufacturers apply that technology to their own products.

Rhode Island's manufacturers and companies know that as well as anyone.

I visited the Hasbro toy company here in Pawtucket just a few years ago.

Engineers from NASA's Langley Research Center worked with some of Hasbro's toy designers to apply some our aerodynamic technology to make a new Nerf glider.

Fountain Head Technologies in Providence commercialized a water purification system from the Apollo days.

Chip Coolers in Warwick is using technology developed at JPL and the Ames Research Center for semi-conductor cooling applications.

There are others: Tabco . . . the Converse shoe company . . . LaserFare . . . and Reade Advanced

Materials, whose owner, Charles Reade is a representative to the NASA Small Business Consortium.

Each is a success story because each shows that when we work together, we don't only get Nerfs gliding higher . . . we get Rhode Island's economy and spirit soaring to record heights.

But the most exciting thing is this:

NASA and Rhode Island are just getting started.

Just as NASA-based technologies from missions past are being applied to help Rhode Island's economy, I believe our missions of the future will literally revolutionize manufacturing.

Currently, the problem many of us face when it comes to engineering a design and ultimately manufacturing a product is that we have to commit about 90 percent of the cost, when we only have about ten percent of knowledge.

That is especially true in the aerospace industry, but it also applies to manufacturers here.

We all have to commit costs to buying materials and tools when there is far too much uncertainty.

What we are left with is choosing between sacrificing flexibility, or risking large cost and schedule overruns.

Both choices stifle new product development and company growth.

And in NASA's case, it slows down the interstellar probe I mentioned, it grounds the planes that will cross the Pacific in four hours, and it delays our trip to Mars.

That's why the success of our missions, but also, to a large extent, the future of manufacturing in a global economy, depends on closing this cost commitment/knowledge gap.

So at NASA, we have a vision to build the tools of the future that will enable our missions of the future.

And when those tools applied here, I have no doubt, they will usher in new era of manufacturing in Rhode Island.

For instance, our missions require us to fully exploit the potential of total immersion virtual presence.

We'll have sight and sound . . .and eventually feel and perhaps even smell.

That way, we'll be able to simulate the research station on an asteroid before we send people there.

When the full capability of this technology makes its way to manufacturers in Rhode Island, it will dramatically shorten the cycle time and cost of product development by enabling a seamless flow from initial concept . . . to final design . . . to manufacturing . . . and ultimately through disposal.

Industry already has some simulation of manufacturing and planning and processes.

We already have simulators of the individual machine. And we have real time assessment of inventory flow control.

Ultimately, we will have the capability so Rhode Island's manufacturers can bring in experts from around the country or the world -- virtually -- to their factory floor.

You will be able to walk a potential shareholder through a virtual tour of the production of their investment.

You will be able to simulate an entire factory before building it.

We will know the metrics and movements of every single piece and every single person, before assembling any single part.

We are taking the first steps today to implement this vision

Soon, we will be launching the first piece of the International Space Station.

When the station is fully assembled -- after roughly 45 separate launches and over 1,000 hours of spacewalks -- this orbiting scientific platform will weigh over one million pounds . . . and be circling the Earth at over 17,000 miles per hour.

It will be so big that it will be visible to the naked eye.

The work has been nothing short of inspiring -- the United States and 15 other nations coming together, pooling resources, and using technologies not to destroy one another . . . but to benefit all of humankind.

And our role has embodied the future of U.S. international leadership in peaceful scientific and technological pursuits.

But ultimately, what is most important is not how we build the Space Station, but how we make the most of the historic opportunity in front of us . . . or should I say . . . above us.

When it comes to utilizing this world-class microgravity laboratory, I can't think of a better way to describe it than this:

The International Space Station will be the Slater Mill of the 21st century . . . the home of the American Manufacturing Revolution.

On Earth, gravity affects the intricate process by which atoms form to crystals, often disturbing their orderly arrangement.

But in microgravity, we can study industrial processes like solidification, fluid flow and combustion with unprecedented clarity.

We'll gain knowledge about materials that could lead to producing new alloys, ceramics, glasses, polymers, semi-conductors and fibers.

In other words, on the International Space Station we will be able conduct extensive and continuous experimentation -- peer-reviewed and repeatable -- in the areas of research that are at the forefront of industrial applications.

What's more is that because the International Space Station will be our platform for the next step in exploration . . . it will also be the testbed for the virtual telepresence technologies and capabilities I mentioned earlier.

And hopefully, just as this capability will enable you to bring experts from around the world to your factory floor . . . it will also enable us to bring together Rhode Island manufacturers and space-based researchers.

This will be done in a virtual environment . . . but also in real time.

We will have such advanced capabilities that we will no longer have to wait for the shuttle to return to Earth to begin analyzing all the data.

We'll do it by integrating humans and computers and robots.

We really do have an incredible opportunity . . . for manufacturing . . . for Rhode Island . . . and for our children and our country.

And I hope -- and believe -- that the only limit to what is possible is our limitless imagination.

I know that kind of imagination exists in this state.

It motivated Samuel Slater to open his mill.

It spurred all of the companies I mentioned earlier to develop new products and to apply new techniques.

It's why all of you are here.

And it is also why I know you will have no problem picturing the image I'd like to leave with you today.

It's that boy in Maine, or any one of those sixth graders from that survey I mentioned, or a child hard at work today in a Pawtucket elementary school.

It's 25 years from now and they are talking with their colleagues about opening the first factory in the place they just arrived.

Mars.

Rhode Island was there in the beginning.

Let's continue to work together to make sure that trip -- and all of the advances for manufacturing -- happen in the future.

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